(No Model.) 4 Sheets—Sheet 1.

E. JORDAN.

Rotary Machine for Closing the Seams of Sheet Metal Cans.

No. 236,499. **Patented Jan. 11, 1881.**

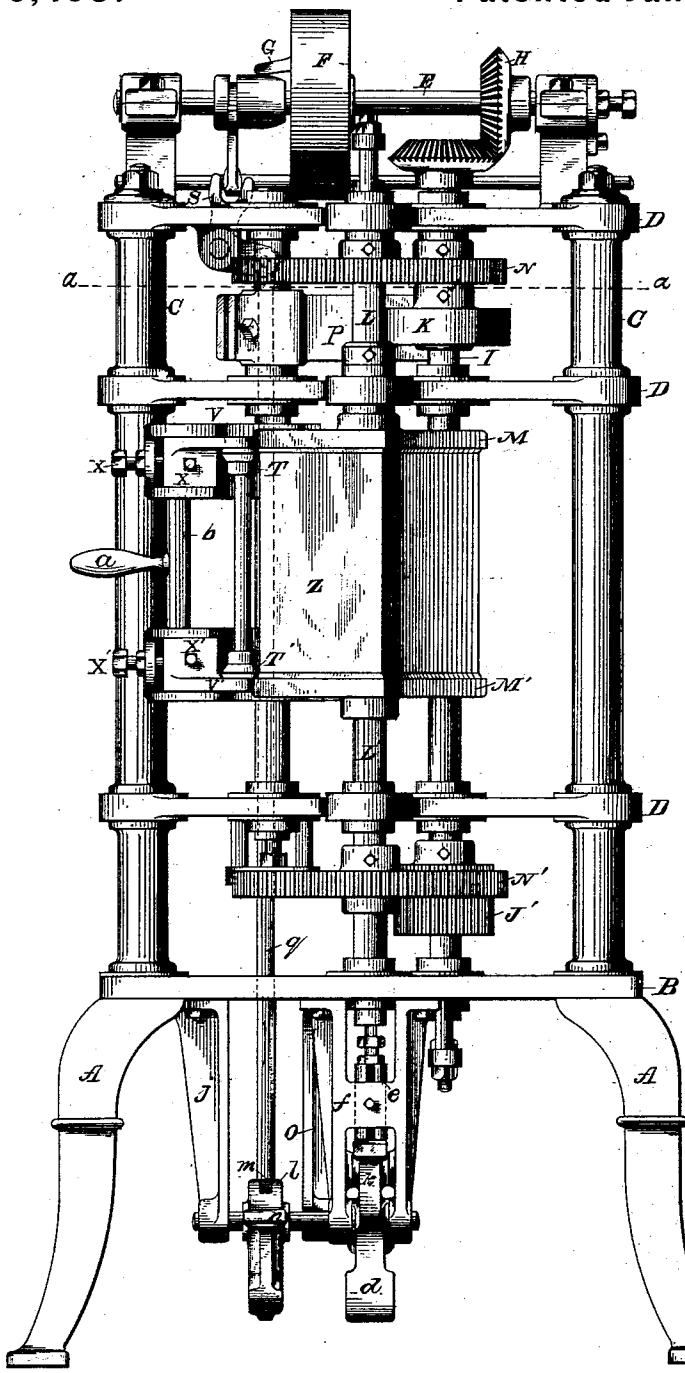

Fig. 1.

Attests:
J. H. Templin.
John Dollerston

Inventor.
Edmund Jordan,
By his Attorneys,
W. C. Strawbridge,
J. Bonsall Taylor.

(No Model.) 4 Sheets—Sheet 2.

E. JORDAN.

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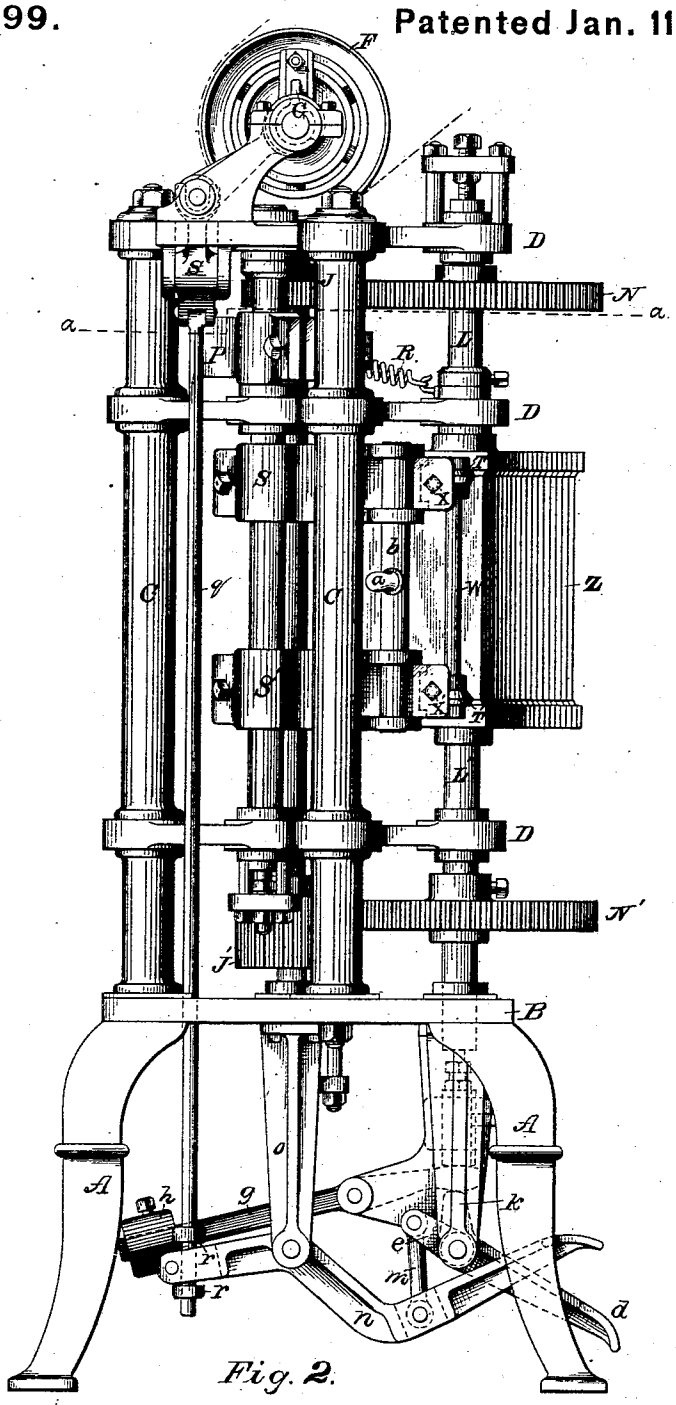

Fig. 2.

Attests:
J. H. Templin.
John Dalley Jr.

Inventor.
Edmund Jordan,
By his Attorneys,
A. C. Fraweridge,
H. Bonsall Taylor.

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E. JORDAN.

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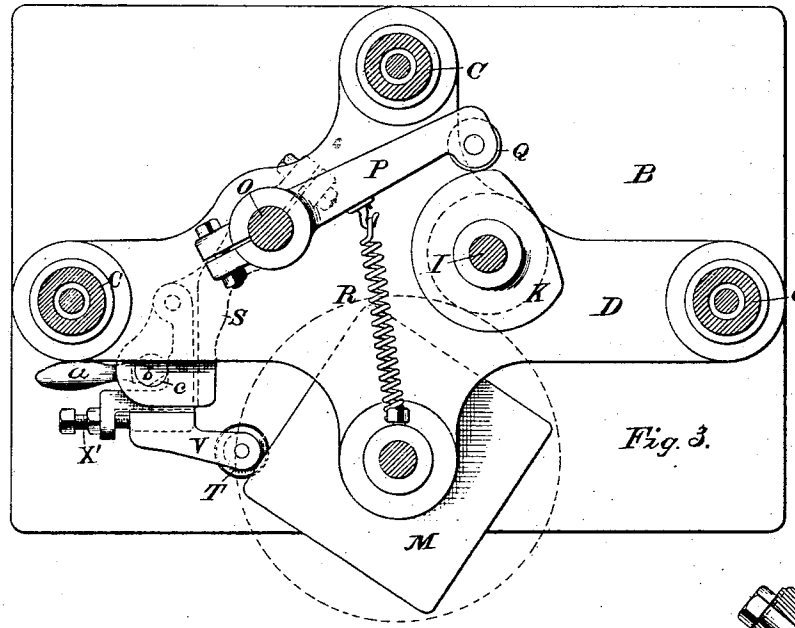

Fig. 3.

Fig. 8.

Fig. 9.

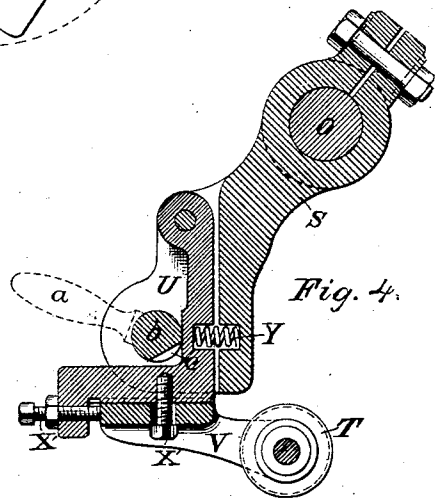

Fig. 4.

Attests:
J. H. Templin.
John Dalley Jr.

Inventor.
Edmund Jordan,
By his Attorneys,
W. C. Strawbridge,
J. Bonsall Taylor.

(No Model.) 4 Sheets—Sheet 4.

E. JORDAN.

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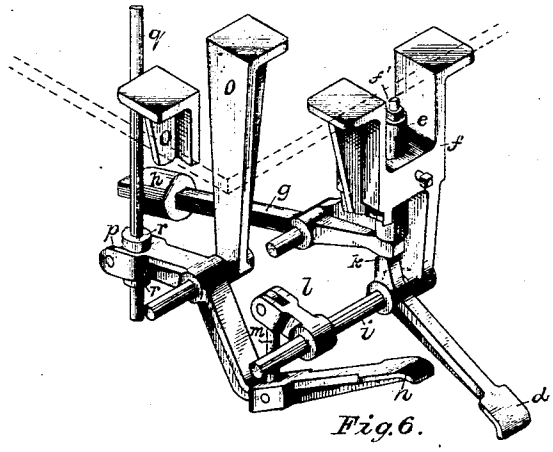

Fig. 6.

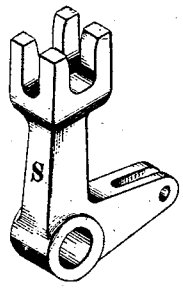

Fig. 7.

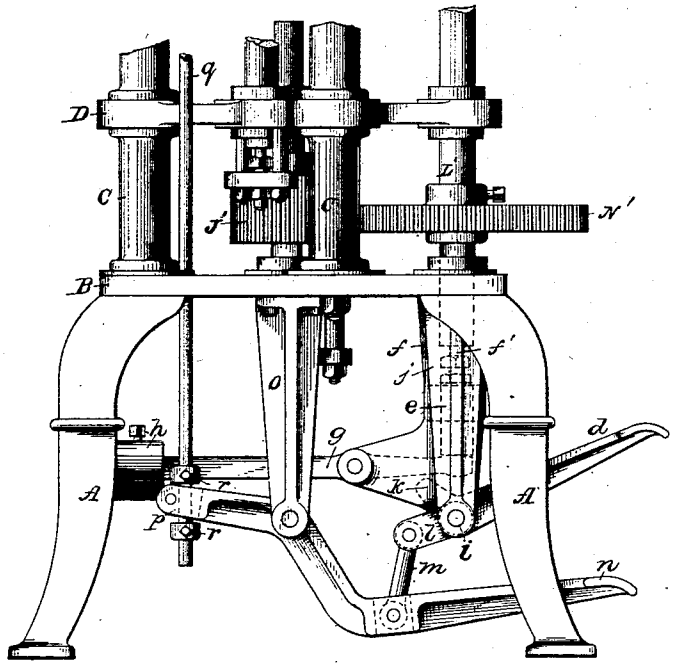

Fig. 5.

Attests:
J. H. Templin.
John Dalley Jr

Inventor.
Edmund Jordan,
By his Attorneys,
W. C. Strawbridge,
J. Bonsall Taylor

UNITED STATES PATENT OFFICE.

EDMUND JORDAN, OF BROOKLYN, NEW YORK, ASSIGNOR TO GEORGE H. PERKINS, OF PHILADELPHIA, PENNSYLVANIA.

ROTARY MACHINE FOR CLOSING THE SEAMS OF SHEET-METAL CANS.

SPECIFICATION forming part of Letters Patent No. 236,499, dated January 11, 1881.

Application filed November 4, 1880. (No model.)

To all whom it may concern:

Be it known that I, EDMUND JORDAN, of Brooklyn, in the State of New York, have invented an Improvement in Rotary Machines for Closing the Seams of Sheet-Metal Cans, of which the following is a specification.

My invention relates in general to the class of mechanisms employed to secure the heads upon the bodies of sheet-metal cans, and relates more specifically to that subdivision of such class which employs rollers caused to bear against the seams to be closed while the can is rotated against the rollers, as opposed to that class in which sliding jaws are brought up against the seams, the cans remaining fixed.

My invention consists, broadly, in a rotary apparatus for seaming the heads upon rectangular, square, hexagonal, or other cans having approximately angular corners, and neither circular nor oval in cross-section.

It consists, further, in mechanism whereby seaming-rolls are caused to travel in continuous and close contact with the head-seams, of whatever exterior contour the same may be, so that in the seaming, for instance, of rectangular cans, the rolls will not only travel around the right-angular corners in contact with the same, but will remain in contact with the straight sides throughout the entire revolution of the can as the latter is revolved against the rolls so operated; and it also consists in an apparatus wherein the foregoing mechanism is conveniently embodied.

In the accompanying drawings, Figure 1 is a front elevation of a machine conveniently embodying my invention; Fig. 2, a side elevation of the same, showing the position of treadles when a can is in place; Fig. 3, a top sectional plan of the machine on the line *a a* of Fig. 1; Fig. 4, a central sectional plan detail of the roller rock-shaft arm and the mechanism for tightening the rolls up against the seams; Fig. 5, a side detail of the base of the machine and its contained treadles, showing the position of the parts when the machine is in condition to receive a can; Fig. 6, a view, in perspective, of the starting and stopping treadles; Fig. 7, a perspective detail of the clutch-operating crank; Fig. 8, a view of the seam to be closed, and Fig. 9 a view of the seam closed.

Similar letters of reference indicate corresponding parts in all of the figures.

In the accompanying drawings, A represents the base of the machine, being a leg frame-work of any suitable construction, supporting a base-plate, B, from which are erected three or more pillars, C, braced together by bearing-plates D, so as to constitute in connection therewith the frame-work of the machine.

E is a driving-shaft journaled horizontally in the head of the frame-work and provided with a driving-pulley, F, from which motion is imparted to it. The driving-pulley is controlled by a clutch, G, of any suitable construction, the operation of which is to make the pulley fast or loose upon the shaft.

H is a bevel-gear, whereby motion is transmitted from the shaft E to a vertical cam-shaft, I, extending from the upper bearing-plate, D, to the base-plate B, and suitably journaled in the same. This shaft is provided at its upper portion with a pinion, J, Fig. 2, and at its lower portion with a pinion, J′, of double the width of the pinion J. It is also provided with a cam, K, Figs. 1 and 3, whereof hereinafter.

L L′ are vertical head-plate shafts journaled in the frame-work, to the lower and upper extremities, respectively, of which are secured the head plates or disks M M′ of the machine, which face each other and clamp between them the can to be closed. Motion of rotation is imparted to these head-plate shafts by two spur-wheels, N N′, keyed thereto, which mesh with and take their motion from the pinions J J′ on the cam-shaft.

Irrespective of other parts, it is obvious that motion communicated to the pulley F, when it is made tight to the driving-shaft E by its clutch, is communicated through the bevel-gear to the cam-shaft, so as to continuously rotate the same, and thence through the pinions upon the cam-shaft to the spur-wheels upon the head-plate shafts, with the result that the head-plates, which are set correspondently, are rotated together in the same direction and at the same rate of speed. When, therefore, a

can is embraced and held tight between these plates the can is rotated by them.

O is a rock-shaft conveniently placed correspondingly to the cam-shaft upon the opposite side of the machine. It is so journaled in the bearing-plates D as to be susceptible of a rocking or oscillating motion.

P is a rock-shaft arm, well shown in Fig. 3, rigidly although adjustably connected with the rock-shaft, and adapted, through the medium of a friction-roll, Q, on its outer extremity, bearing against the cam K, to impart to the rock-shaft O a rocking or vibratory motion taken from the cam.

R is a coil-spring connected to some fixed portion of the frame-work and operating to keep the roller of the rock-shaft arm P in contact with the cam K.

S S′ are roller rock-shaft arms, rigidly although adjustably connected to the rock-shaft O, and so set as to have the seaming-rolls, with which their outer extremities are provided, almost but not quite in contact with the seams of the can.

T T′ are the seaming-rolls (shown in Figs. 4, 1, and 2) secured upon opposite ends of a vertical roll-shaft, W, journaled in projecting arms V V′, which are adjustably secured, by means of the adjusting-screws X X′, to the hinged brackets U U′, pivoted to the roller rock-shaft arms S S′. These rollers turn freely together with or upon their shaft W, and are so conformed as to be adapted to close the seams designed to be acted upon. For seams such as are shown in Figs. 8 and 9 they are well-shaped, as in the drawings. For other shapes of seam they are correspondingly modified in form.

Y is an inclosed spiral spring operating, when not otherwise controlled, to keep the hinged bracket U U′ away from the roller rock-shaft arms S S′, to which the former are pivoted, and thereby to keep the rolls at a slight distance away from the seams of the can. A revolution of the cam K, acting through the arm P upon the rock-shaft O, oscillates the arms S S′, the outline of the cam being such that the rolls T T′ are always retained in contact with the seam of the can throughout the revolution of the latter.

In Fig. 3 of the drawings is shown a cam, K, of such outline as to cause the rolls T T′ to close the seams of a rectangular cam, Z, such as that represented in place in the machine. This cam makes four revolutions to one of the can. It is, however, obvious that by shaping the cam to correspond in its operation upon the rocking parts to the exterior outline of the can which it is desired to seam the machine can be adapted to the seaming of hexagonal or other cans not being round or oval.

a is a lever-handle secured to an eccentric shaft, *b*, journaled in the roller rock-shaft arms S S′, as well shown in Fig. 4. This shaft is notched or flattened, as at *c*, at both of its extremities and at the portions where it bears against the hinged brackets U U′, so that when it is placed in the position shown in Fig. 4 it holds said brackets and their rollers more closely up against the rock-shaft arms S S′ than when the lever *a* is drawn forward, so as to cause the notched surfaces *c* to coincide with the rear face of the brackets U U′, in which latter position the inclosed spring Y throws the brackets U U′ and the rollers T T′ away from the rock-shaft arms S S′, and in consequence slightly away from the seams of the can. This whole device, therefore, is one for tightening or loosening the seaming-rolls with respect to the seams of the can, so as to enable the putting of the can into the machine and its removal therefrom without interference from the rolls. When, however, the can is in the machine the handle *a* is deflected into the position shown in Fig. 4, and the rolls T T′ brought up tight against its seams, and it is in this latter position that the parts remain while the machine is in action for the closing of the heads.

The lower head-plate shaft, L′, is arranged to slide in its bearings up and down, so as to raise and lower the lower head-plate, M′, and permit of the introduction and removal of the can. In order to accomplish this action and yet insure the rotation of the head without its ungearing, the pinion J′ on the cam-shaft is made of double the width of the spur-wheel N′ of the shaft L′, so that, whatever be the position of the head-plate M′, the leaves of the spur-wheel N′ will still be engaged with those of the pinion J′. The lower extremity of the head-plate shaft L′ rests upon a vertical slide, *e*, contained in a suitable bearing, *f*, depending from the base-plate of the machine.

The slide *e* is adjustable in length, by means of the screw-bolt *f*′, to accommodate the disks to cans of varying height, and rests in turn upon the forward extremity of the balance-lever *g*, pivoted to backwardly-extending ears of the bearing *f* in the manner shown. This lever *g* is balanced by its weight *h*, so as to overcome the jar occasioned by the descent of the lower head-plate, M′, upon the removal of the can, the weight of the head-plate and its shaft being sufficient to overcome the balance-weight of the lever and raise said weight into the position shown in Fig. 5.

i is a treadle-shaft, suitably journaled in the bearing *f* and the hanger *j*. To this shaft is keyed the starting-treadle *d*, a toe, *k*, of which registers in line beneath the forward extremity of the balance-lever *g*. When the starting-treadle *d* is depressed this toe forces up the forward extremity of the weight-lever, elevates the slide *e*, and with it the shaft L′ and its head-plate M′, the position of parts then becoming that shown in Fig. 2. The can is set in place upon the head M′ before the depression of the treadle *d*. As the treadle *d* is depressed it not only raises the lower head-plate and clamps the can between the heads

in the manner described, but it also rotates the treadle-shaft *i*, in so doing raises a crank, *l*, secured thereto and connected, by means of a link, *m*, with the forward portion of the stopping-treadle *n*, pivoted in a hanger, *o o*, elevates the forward portion of said stopping-treadle *n*, and causes a fork, *p*, backwardly extending therefrom, to draw down the clutch-operating rod *q*, which is adjustably connected thereto by collars *r*, as shown in Figs. 2 and 5. The drawing down of the rod *q* draws down the horizontal arm of the clutch-operating crank *s*, pivoted in the upper frame-work, throws its vertical forked arm to the right, Fig. 1, and thereby throws the clutch into gear with the pulley F, whereby said pulley is made fast to the shaft and motion communicated to the machine. It is obvious, therefore, that by the action of the starting-treadle a can is not only secured in place between its head-plates, but the machine is started so that the can is rotated against the seaming-rolls.

When it is desired to stop the seaming action after the can has been sufficiently rotated the stopping-treadle is depressed, whereby the clutch-operating rod *q* is elevated and the clutch thrown out of gear, so as to stop the revolution of the pulley; whereby, also, the link *m* is drawn down and the treadle-shaft *i* thereby rotated, so as to deflect away the toe *k* of the starting-treadle from beneath the balanced lever, so as to remove the support from beneath the shaft of the lower head-plate and permit the descent of the same for the removal of the can.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a machine for closing the seams which secure the heads to the bodies of rectangular, square, hexagonal, or other sheet-metal cans not circular or oval, the following instrumentalities in combination: first, a pair of head plates or disks conformed to the shape of the heads of the can to be closed and adapted by suitable means together to retain and rotate the can; second, seaming-rolls; third, mechanism whereby the seaming-rolls are retained against the seams of the heads and in close conjunction therewith throughout the entire length of the seams, of whatever outline the seams may be.

2. In a machine for closing the head-seams of rectangular, square, hexagonal, or other shaped cans not being circular or oval, the combination of a pair of head-plates conformed to the outlines of the heads of the cans and adapted to retain and rotate the same, seaming-rolls secured to a rock-shaft in such manner as to be capable of receiving therefrom a movement which will enable their traveling in contact with all portions of the seams of the can, a cam acting upon the rock-shaft of the seaming-rolls of such outline as to impart the requisite movement to the rolls, and mechanism whereby the head-plates and cam are revolved to secure the revolution of the can and the proper movement of the seaming-rolls.

3. In a machine for closing the seams of sheet-metal cans, the combination, to secure the setting up of the seaming-rolls against the seams of the can, of the brackets U U′, hinged to the rock-shaft arms S S′ and controlled by an eccentric shaft, *b*, and the spring Y.

4. The combination, to form a device whereby the lower head-plate of a can-seaming machine can be alternately lifted and dropped, of the starting-treadle *d*, pivoted upon the treadle-shaft *i*, the balanced lever *g*, and the stopping-treadle *n*, connected with the treadle-shaft *i* and its starting-treadle by the link *m* and crank *l*, substantially as shown and described.

In testimony whereof I have hereunto signed my name this 18th day of October, A. D. 1880.

EDMUND JORDAN.

In presence of—

J. BONSALL TAYLOR,

ELIPHALET W. BLISS.